

AMENDMENTS TO THE DRAWINGS

The attached replacement sheet of drawings includes changes to Fig. 2. Specifically, reference numerals 32 and 33 are provided for the transmit and receive lines to replace the incorrect numerals 31 and 32 of the original drawing.

REMARKS

The Office Action mailed September 22, 2005, has been carefully reviewed and the foregoing amendment has been made in response thereto. Claims 11-16 have been added. Claims 1-16 are pending in the application.

The objection to the drawing is respectfully traversed. The Office Action correctly pointed out the error in reference numerals in Figure 2. A corrected drawing sheet is attached wherein the reference numerals associated with the transmit and receive lines have been changed to 32 and 33 so that Figure 2 is consistent with the specification.

The rejection of claims 1, 4, 8, and 9 under 35 USC 103(a) as being unpatentable over Kitamura et al in view of Hatamian is respectfully traversed.

The present invention relates to a testing apparatus for accessing echo cancellers in a telephone system. Echo cancellers are typically deployed together with a codec dedicated to each subscriber line (i.e., DS-0 line). Prior art testing has required connecting test equipment to each DS-0 line to be tested, which is undesirably time consuming and inconvenient. The present invention enables echo cancellers to be tested by connecting test equipment to a DS-1 line where a group of DS-0 lines are multiplexed together, thereby greatly reducing the number of test equipment connections to be made.

Claim 1 recites a first line interface, a first framer, and a test controller. The first line interface provides layer-1 interfacing to a communications trunk carrying a trunk signal. The first framer provides layer-2 interfacing to the trunk signal to make available frames of multiplexed individual subscriber signals which each includes respective transmit and receive signals. The test controller continuously de-multiplexes the frames, samples a de-multiplexed individual transmit signal from a selected individual subscriber signal, stores the samples in a queue for a selected echo delay, adds the samples to an individual receive signal for the selected individual subscriber signal after the selected echo delay, and continuously re-multiplexes the frames.

The rejection cites Kitamura as teaching the first line interface, the first framer, and the test controller. It is respectfully pointed out that Kitamura fails to either disclose or suggest these elements as claimed. Kitamura cannot access to echo cancellers from a point where the subscriber signals are multiplexed together. The objective of Kitamura is to provide an echo canceller that is self-testing (col. 1, line 56, to col. 2, line 4).

The rejection points to Figure 9 of Kitamura in suggesting that high-speed digital line interface circuit 95 corresponds to the recited line interface. However, circuit 95 does not interface between a test controller and a trunk signal. The echo cancellers and the control unit are on the de-multiplexed side of unit 94. Control unit 93 has a separate connection with each echo canceller 92. Thus, Kitamura is subject to the prior art problem that is solved by the present invention.

The first framer recited in claim 1 makes available frames of multiplexed individual subscriber signals and provides them to the test controller. Since the echo canceller signals being analyzed in Kitamura never leave the echo canceller, there is no framer that interfaces to a trunk signal as is recited in claim 1. Likewise, there is no test controller for manipulating frames as recited in claim 1 since Kitamura performs testing functions only within each individual echo canceller and does not connect any test equipment to a point where individual subscriber signals are multiplexed.

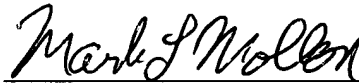
Hatamian fails to correct for the deficiencies in the teachings of Kitamura. Hatamian is directed to controlling a voltage at a node within a transceiver circuit. Consequently, there are no multiplexed subscriber circuits and no test equipment for accessing a multiplexed signal that frames, de-multiplexes, stores, delays, adds, or re-multiplexes subscriber signals. Therefore, the combination of Kitamura and Hatamian fails to suggest the limitations of claim 1 or its dependent claims 2-7.

Claim 8 similarly recites connecting test equipment to receive the multiplexed signal in order to test echo cancellers connected to individual terminals. Therefore, claim 8 and its dependent claims 9 and 10 are likewise allowable.

New claim 11 is similar to original claim 2 which was indicated as being directed to allowable subject matter. In addition, claim 11 is specifically directed to a DS-1 communication line. Therefore, claims 11-16 are submitted to be allowable.

In view of the foregoing amendment and remarks, claims 1-16 are now in condition for allowance. Favorable action is respectfully solicited.

Respectfully submitted,



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